Remarks:

Summary of the November 18, 2009, Office Action

In the November 18, 2009, Claims 1 and 2 were rejected under 35 U.S.C. Section 112, second paragraph, as being indefinite.

On the merits, Claims 1-4, 9, 10, 23, and 38were rejected under 35 U.S.C. Section 102(b) as being anticipated by the Angeley reference (U.S. Patent No. 6,282,223). Claims 6 and 8 were rejected under 35 U.S.C. Section 103(a) as being unpatentable over the Angeley reference in view of the Smart reference (U.S. Patent Application Publication No. 2002-0093997). Claims 26-27, 31-33, 35, 37, 39, 43, and 44 were objected to as being dependant upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Inasmuch as Claim 37 is an independent claim, it appears that it has been allowed since by definition it does not depend upon any other claim.

Amendments to the Claims

Claims 1, 27, and 38 have been amended to consistently use the terminology "beam quality factor M^2." Basis for this is found in the substitute specification in paragraph 0017, in the passage found on page 4, line 33 to page 5, line 6. It is this beam quality factor M^2 that is maximized, not beam quality *per se*.

Section 112 Indefiniteness Rejections

Applicants have corrected the Section 112 indefiniteness deficiencies asserted by the Examiner in Claims 1 and 2. Claims 1 and 2 have both been amended to deal with this issue, and, as such, Applicants believe that the Section 112 deficiencies noted by the Examiner have been eliminated.

Section 102(b) Rejections on the Angeley Reference

Independent Claims 1 and 38 are both rejected under Section 102(b) on the Angeley reference, specifically with reference to FIG. 1 of the Angeley reference (which is clearly labeled as prior art) and the portion of the specification associated therewith (column 3, lines 15-61 is cited by the Examiner in the comments relating to Claims 1 and 38). (The other embodiments shown in the Angeley reference clearly fail to teach the invention as claimed in Claims 1 and 38.)

The Examiner asserts that "Angeley discloses in Fig. 1 a solid state laser gain medium 22 having first and second ends 22A and 22B along a laser optical axis 20 in which each end is profiled concave to provide a level of thermal lens compensation at a desired operating pump power **such that the beam has a quality is maximized at the desired operating pump power**..." November 18, 2009, Office Action, page 4, emphasis added.

There is absolutely no basis for this assertion, since the Angeley reference says nothing of the sort. In fact, the discussion in the Detailed Description of the Invention

relating to the embodiment of FIG. 1 does not contain a single word either expressly or inferentially stating that beam quality if maximized at the desired operating power. The embodiment of FIG. 1, which is clearly labeled as prior art, is also discussed in the Angeley reference in its Discussion of Background Art in Column 1, lines 15-61, which is unmistakably referring to the prior art device shown in FIG. 1 as demonstrated by the following text:

> "Such a laser is typically arranged to provide laser-radiation having a wavelength of 2.94 micrometers (μm). A preferred design of such a laser includes a symmetrical resonator formed between two plane (flat) mirrors. This can be defined as a flat-flat resonator." Column 1, lines 26-30.
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> "The gain medium is in the form of a rod of circular cross-section and is symmetrically disposed between the mirrors. The ends of the rod have a concave radius of curvature. The radius of curvature is the same at both ends of the rod." Column 1, lines 34-38.

This is exactly the configuration shown in and described in conjunction with FIG. 1. There is, in fact, a mention of "beam quality" for this device, wherein it specifically states that this device, which is used in medical applications such as dermatological applications "**is not required to have the highest possible beam quality factor**." See column 1, lines 15-18, emphasis added. Thus, it is clear that the Angeley reference explicitly teaches that the device shown in FIG. 1 "is not required to have the highest possible beam quality factor," which is the exact opposite of the Examiner's assertion that "that the beam has a quality is maximized at the desired operating pump power." The

Angeley reference thus quite clearly did not teach the invention as claimed in Claims 1 and 38, even before these claims were amended herein.

With the amendment made to Claims 1 and 38, the distinction is even clearer. The Angeley reference quite clearly fails to teach (or suggest in any way) "that the beam has a **beam quality factor M^2** maximized at the desired operating pump power" as specifically required in Claim 1 (emphasis added) or that the device is configured "in order to maximize the **beam quality factor M^2** of the beam at said desired operating pump power" as specifically required in Claim 38 (emphasis added). In fact, the only reference in the Angeley referent to M^2 at all is in Column 6, line 48, which only mentions "beam quality (M^2)" in passing. This reference is made in conjunction with the device shown in FIG. 3 of the Angeley reference, which is completely dissimilar in any way to the device claimed in Claims 1 and 38 of the Applicants' patent application.

Further, independent Claim 1 as amended requires that "each end is profiled concave ... **such that the beam has a beam quality factor M^2 maximized**..." Emphasis added. Independent Claim 38 the same limitation. Thus, Claims 1 and 38 are certainly not anticipated by the Angeley reference, which is completely silent with respect to the issue of maximizing the beam quality factor M^2.

The inventors have recognized that maximizing the beam quality factor M^2: 1. maximizes the gain overlap; (i.e. the amount of the gain medium occupied by the beam); 2. maximizes gain extraction; 3. maximizes the stability with respect to small

changes in thermal lensing caused by, for example, laser/diode aging; and 4. avoids the need for at least one curved cavity mirror and, hence, an asymmetric cavity. The device shown in FIG. 1 of the Angeley reference is not taught to maximize the beam quality factor M^2, and in fact is expressly taught in the Angeley reference to **not have the highest possible beam quality factor** (which is also a criteria different from beam quality *per se*). Applicants therefore respectfully request that the rejection of Claims 1 and 38 be removed.

Since Claim 1 is patentable, dependent Claims 2-4, 6, 8-10, 23, 26, 27, 31-33, 35, 42, and 43 are accordingly also patentable as depending from an allowable claims, and their allowance is requested as well.

Section 103(a) Rejection on the Angeley Reference and the Smart Reference

Since the Smart reference is cited only with regard to Claims 6 and 8, which ultimately depend from Claim 1, which, as stated above, is believed to be allowable, there is no need to discuss this rejection since it is believed to be moot in view of the allowability of Claim 1.

Conclusion

Claims 1-4, 6, 8-10, 23, 26, 27, 31-33, 35, 37-39, and 43 remain pending in the present patent application, and Applicants believe that they are in condition for allowance at this time. As such, Applicants respectfully request entry of the present Amendment D

and reconsideration of the application, with an early and favorable decision being solicited. Should the Examiner believe that the prosecution of the application could be expedited, the Examiner is requested to call Applicants' undersigned attorney at the number listed below.

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